

Claims

What is claimed is:

1. A light emitting diode (LED) lamp for mounting to an existing fixture for a fluorescent lamp having a ballast assembly including ballast opposed electrical contacts, comprising:
 - a tube having tube ends,
 - at least one LED positioned within said tube between said tube ends,
 - electrical circuit means for providing electrical power from the ballast assembly to said at least one LED,
 - means for electrically connecting said electrical circuit means with the ballast opposed electrical contacts,
 - said electrical circuit means including an LED electrical circuit including at least one electrical string positioned within said tube and generally extending between said tube ends, said at least one LED being in electrical connection with said at least one electrical string,
 - said at least one LED being positioned to emit light through said tube,
 - means for supporting and holding said at least one LED and said LED electrical circuit,
 - means for reducing ballast voltage being delivered from the ballast assembly, said means for reducing ballast voltage being in electrical connection with said electrical circuit means,
 - means for controlling the delivery of said electrical power from said ballast assembly to said at least one LED,
 - means for detecting the level of daylight around the illumination area of said least one LED, and
 - means for transmitting to said means for controlling a control signal relating to the detected level of daylight from said means for detecting.
2. The LED lamp in accordance with claim 1, wherein said means for controlling includes an on-off switch positioned in said LED lamp on said electrical circuit in operative association with said at least one LED, said switch being operable between an on mode wherein electrical power is delivered to said at least one LED in accordance with said control signal and an off mode wherein said electrical power is not delivered to said at least one LED in accordance with said control signal.
3. The LED lamp in accordance with claim 2, wherein said means for detecting is at

least one light level photosensor in operative signal association with said switch, wherein said at least one light level photosensor sends a signal to said switch to operate said switch to a closed mode when a lower level of daylight is detected around the illumination area of said at least one LED, wherein power is transmitted to said at least one LED in said at least one LED array to illuminate, and further wherein said at least one light level photosensor sends a signal to said switch to operate said switch to an open mode when a higher level of daylight is detected around the illumination area of said at least one LED, and wherein power is not transmitted to said at least one LED and illumination from said at least one LED array ceases.

4. The LED lamp in accordance with claim 3, wherein said means for transmitting a control signal includes a control signal path comprising a control signal line connection from said at least one photosensor to said switch.

5. The LED lamp in accordance with claim 3, wherein said means for transmitting a control signal includes a control signal path comprising a wireless signal from said at least one photosensor to said switch.

6. The LED lamp in accordance with claim 3, further including an external source of AC power and a PLC line connecting said source of AC power with said switch, and wherein said means for transmitting a control signal includes a control signal path comprising a control signal line path connected to said PLC line from said at least one photosensor to said switch.

7. The LED lamp in accordance with claim 3, wherein said at least one photosensor is positioned within said LED lamp.

8. The LED lamp in accordance with claim 3, wherein said at least one photosensor is positioned external to said LED lamp.

9. The LED lamp in accordance with claim 3, further including at least one occupancy sensor in operative signal association with said switch, wherein said at least one occupancy sensor sends a signal to said switch to operate said switch to a closed mode when a person is detected around the illumination area of said at least one LED, wherein power is transmitted to said LED array to illuminate, and further wherein said at least one occupancy sensor sends a signal to said switch to operate said switch to an open mode when a person is not detected around the illumination area of said at least one LED, wherein power is not transmitted to said at least one LED and illumination from said at least one LED array ceases.

10. The LED lamp in accordance with claim 9, wherein said at least one occupancy sensor is positioned internal to said LED lamp.

11. The LED lamp in accordance with claim 9, wherein said at least one occupancy

sensor is positioned external to said LED lamp.

12. The LED lamp in accordance with claim 9, wherein said means for transmitting a control signal includes a control signal path from said at least one occupancy sensor to said switch.

13. The LED lamp in accordance with claim 12, wherein said control signal path from said at least one occupancy sensor comprises a control signal line connection to said switch.

14. The LED lamp in accordance with claim 12, wherein said control signal path from said at least one occupancy sensor comprises a wireless signal to said switch.

15. The LED lamp in accordance with claim 12, further including an external source of AC power and a PLC line connecting said source of AC power with said switch, and wherein said control signal path from said occupancy sensor comprises a control signal line wire connected to said PLC line to said switch.

16. The LED lamp in accordance with claim 2, wherein said means for controlling includes at least one current driver dimmer positioned in said LED lamp and in operative signal and power association with said at least one LED, said at least one dimmer being for regulating the amount of power provided by said electrical power to said at least one LED.

17. The LED lamp in accordance with claim 16, wherein said means for controlling further includes a computer positioned in said lamp in operative power and signal association with said at least one dimmer, wherein said computer includes computer controls for signaling said at least one dimmer to regulate the degree of power input to said at least one LED to control the degree of illumination by said at least one LED, said means for transmitting to said means for controlling a control signal relating to the detected level of daylight from said means for detecting being directed to said computer.

18. The LED lamp in accordance with claim 17, wherein said computer controls include signaling said dimmer to reduce power sent to said at least one LED by a set amount.

19. The LED lamp in accordance with claim 17, wherein said means for transmitting a control signal includes a control signal path comprising a control signal line connection from said at least one light level photosensor to said computer.

20. The LED lamp in accordance with claim 17, wherein said means for transmitting a control signal includes a control signal path from said at least one light level photosensor comprising a wireless signal to said computer.

21. The LED lamp in accordance with claim 17, further including an external source of AC power and a PLC line connecting said source of AC power with said switch, and

wherein said means for transmitting a control signal includes a control signal path comprising a control signal line path from said at least one light level photosensor connected to said PLC line to said computer.

22. The LED lamp in accordance with claim 17, further including at least one occupancy sensor in operative signal association with said computer, wherein said at least one occupancy sensor sends a signal to said computer to operate said computer when a person is detected around the illumination area of said at least one LED, and wherein power is transmitted to said at least one dimmer to illuminate the illumination area of said at least one LED.

23. The LED lamp in accordance with claim 22, wherein said means for transmitting a control signal includes a control signal path from said at least one occupancy sensor comprising a control signal line connection to said computer.

24. The LED lamp in accordance with claim 22, wherein said means for transmitting a control signal includes a control signal path from said at least one occupancy sensor comprising a wireless signal to said computer.

25. The LED lamp in accordance with claim 22, further including an external source of AC power and a PLC line connecting said source of AC power with said switch, and wherein said means for transmitting a control signal includes a control signal path comprising a control signal line path from said at least one occupancy sensor connected to said PLC line to said computer.

26. The LED lamp in accordance with claim 22, further including another LED lamp having another at least one LED positioned in another tube including other electrical power and another ballast assembly and other means for controlling the delivery of said other electrical power from said another ballast assembly to said another LED lamp, said another LED lamp further including at least one another photosensor in operative signal and power association with said at least one LED, said at least one another photosensor being positioned in said another tube, said at least one another photosensor being for detecting the level of daylight around the illumination area of said at least one another LED.

27. The LED lamp in accordance with claim 26, further including another current driver dimmer in operative signal and power association with said another at least one LED, said another dimmer being positioned in said another tube, said another dimmer being for regulating the amount of power provided by said other electrical power to said another at least one LED, said at least one another photosensor being in operative signal and power

association with said at least one LED, said at least one another photosensor being positioned in said another tube.

28. The LED lamp in accordance with claim 27, wherein said means for controlling further includes another computer positioned in said another lamp in operative power and signal association with said another dimmer, wherein said another computer includes computer controls for signaling said another dimmer to regulate the degree of power input to said another at least one LED to control the degree of illumination by said another at least one LED, said means for transmitting to said means for controlling a control signal relating to the detected level of daylight from said means for detecting being directed from said at least one another photosensor to said another computer.

29. The LED lamp in accordance with claim 28, wherein said computer and said at least one photosensor are in network signal communication with said at least one another photosensor and with said another computer, wherein first photosensor data signals from said at least one photosensor and second photosensor data from said at least one another photosensor received by said computer and by said another computer are continuously compared in accordance with a computer program, wherein said computer signals said dimmer and said at least one another computer signals said another dimmer, and wherein the regulation of power outputs of said dimmer and said another dimmer to said at least one LED and said another at least one LED are equal.

30. The LED lamp in accordance with claim 28, wherein said computer and said at least one photosensor are in network signal communication with said at least one another photosensor and with said another computer, wherein first photosensor data signals from said at least one photosensor and second photosensor data from said at least one another photosensor received by said computer and by said another computer are continuously compared in accordance with a computer program, wherein said computer signals said dimmer and said at least one another computer signals said another dimmer, and wherein the regulation of power outputs of said dimmer and said another dimmer to said at least one LED and said another at least one LED are not equal.

31. The LED lamp in accordance with claim 29, further including another occupancy sensor positioned in said another tube in operative signal and power association with said at least one LED, said another photosensor being for detecting the level of daylight around the illumination area of said another at least one LED, said means for transmitting to said means for controlling a control signal relating to the detected level of daylight from said means for

detecting being directed from said another occupancy sensor to said another computer.

32. The LED lamp in accordance with claim 31, wherein said photosensor, said another photosensor, said occupancy sensor, and said another occupancy sensor are in mutual network communication in relation to said dimmer and said another dimmer.

33. The LED lamp in accordance with claim 1, wherein said at least one LED is a plurality of LEDs.

34. The LED lamp in accordance with claim 1, wherein said at least one LED is an OLED.

35. The LED lamp in accordance with claim 1, wherein said current driver dimmer is a plurality of current driver dimmers.

36. The LED lamp in accordance with claim 1, wherein said means for controlling includes a logic gate array.

37. The LED lamp in accordance with claim 1, wherein said means for controlling includes a timer.

38. The LED lamp in accordance with claim 1, wherein said means for supporting and holding said at least one LED and said LED electrical circuit being positioned within said tube between said tube ends.

39. The LED lamp in accordance with claim 1, wherein said means for supporting and holding said at least one LED and said LED electrical circuit being said tube ends.

40. The LED lamp in accordance with claim 1, wherein said means for reducing ballast voltage includes at least one voltage surge absorber (ZNR).

41. The LED lamp in accordance with claim 1, wherein said means for reducing ballast voltage includes at least one movistor (MOV).

42. The LED lamp in accordance with claim 1, wherein said means for reducing ballast voltage includes at least one varistor.

43. The LED lamp in accordance with claim 1, wherein said means for reducing ballast voltage includes at least one transformer.

44. The LED lamp in accordance with claim 3, wherein said at least one light level photosensor is a plurality of light level photosensors.

45. The LED lamp in accordance with claim 9, wherein said at least one occupancy sensor is a plurality of occupancy sensors.

46. The LED lamp in accordance with claim 17, wherein said computer is a logic gate array.